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INTRODUCTION

The Southwest Fisheries Center began analyzing Hawaii's seafood markets in 1978. An analysis of market structure was performed in 1981,[1] and seafood consumption was estimated by calculating net imports for the period 1970-77 (Hudgins 1980). Two surveys, including a preliminary enumeration of total seafood volume in 1980 and a monthly sampling of wholesale prices and quantities in late 1981 and early 1982, have also been conducted. This report presents tables based on the enumeration survey and provides quantitative information on the flow of seafood through Hawaii's wholesale market. Cross-sectional results from the enumeration survey were reported by the Laboratory in an earlier administrative report.[2] Later reports will cover the 1981-82 monthly surveys and a subsequent survey of retail markets.

Several qualifications pertain to the use of the data in this report. First, the 1980 enumeration survey consisted of 106 firms of a total of 119 identified as wholesale fish dealers. While most of the 13 firms that could not be surveyed were apparently small dealers, at least one is known to be a relatively large importer of frozen seafood. This report deletes from the 1980 sample one firm which acts primarily as a seafood importer, rather than as a wholesale dealer. Thus, the overall sample size for this report is 105 firms. Data are reported for the 1979 calendar year.

Second, not all seafood funnels through the wholesale market. Some goes directly from local harvesters to the retail sector while some imported seafood is purchased by major supermarkets and other large retail outlets directly from mainland or foreign wholesale firms or brokers. A survey of the latter segment of the market is being undertaken in the second half of 1982. Thus, although the 1980 survey covered a large percentage of the wholesale market, the results represent only a portion of the entire seafood market in Hawaii.

Third, the raw data have not yet been inspected and analyzed for anomalies that may have arisen in the interviewing process or in data coding. As such, the results should still be viewed as preliminary. However, initial use of the data indicates that the magnitude of any such error on a statewide basis is probably small. Only a few questions in the 1980 enumeration survey were related to actual dollar amount transactions. Instead, the survey concentrated on obtaining information on the percentage of wholesale business in various purchases, sales, and species categories. Therefore, most of the data in this report are calculated from these

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[1]Adams, M. F. 1981. Competition and market structure in the Hawaii fish industry. Southwest Fish. Cent. Admin. Rep. H-81-5. Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812, 20 p.

[2]U.S. National Marine Fisheries Service. 1982. Preliminary results of a survey of wholesale fish dealers in Hawaii. Southwest Fish. Cent. Admin. Rep. H-82-14. Southwest Fish. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96812, 17 p. + Appendix.

percentages "weighted" by each firm's total wholesale purchases or revenues. Tables have been constructed from the available data and in some cases firms did not answer all questions. Hence, totals may vary slightly between tables depending on the number of firms which responded.

Fourth, in order to protect the confidentiality of individual business enterprises, fish purchased from local auctions have been included in purchases from local fishing vessels.

If there are questions concerning the meaning of individual variables in these tables, the reader can refer to the previous administrative report which contains the survey questionnaire or contact the Laboratory.

RESULTS

Tables 1-12 present quantitative information on the flow of seafood through Hawaii's wholesale fish market.

Table 1.--Characteristics of Hawaii's wholesale seafood market in 1979.

Category	Number		
Total number of firms	118	firms	
Number of firms surveyed	105		
Type of business			
Wholesale	105	firms	
Retail	63		
Processing	27		
Storage	15		
Percent business which is wholesale (average)	72.9%		
Type of product			
Fresh	63	firms	
Frozen	63		
Canned and bottled	17		
Salted, dried, and smoked	26		
Fish cake	13		
Average starting year	1960		
Number of employees			
Full-time paid	1,490	employees	
Part-time paid	618		
Full-time unpaid	33		
Part-time unpaid	3		
Market volume[1]	Value		Pounds
Total purchases	$55.0	million	30.4 million
Fresh	25.7		12.7
Frozen	22.9		17.5
Other	6.4		0.2
Total sales	$77.1	million	30.6 million
Fresh	32.7		13.8
Frozen	33.1		12.8
Other	11.3		4.8

[1]These summary figures have been adjusted to replace missing observations. This may account for more pounds sold than purchased and indicates the reason for deviations with other tables.

Table 2.--Type of product as percentage of wholesale sales revenue in 1979.

Type of product	Percent
Fresh	42.7
Frozen	43.8
Canned and bottled	6.5
Salted, dried, and smoked	3.5
Fish cake	3.4
Total	99.9
N = 102 firms	

Table 3.--Sales of major species groups as percentage of total wholesale revenue in 1979.

Species group	Percent
Tunas	27.0
Bottom fishes	18.6
Mahimahi (dolphinfish)	14.2
Crustaceans	11.4
Mollusks	7.7
Billfishes	3.2
Reef fishes	1.9
Ono (wahoo)	1.8
Akule (bigeye scad)	1.3
Opelu (mackerel scad)	1.2
Sharks	0.0
Others	11.6
Total	99.9
N = 102 firms	

Table 4.--Source of wholesale purchases as percentage of total wholesale purchases in 1979.

Source	Percent	Percent
Local fishers	35.0	
Local wholesalers/brokers	9.7	
Total local		44.7
Mainland imports	30.0	
Foreign imports	23.3	
Unspecified imports	1.3	
Total imports		54.6
Unspecified sources		0.7
Total		100.0
N = 99 firms		

Table 5.--Destination of wholesale products as percentage of total wholesale revenue in 1979.

Destination	Percent
Local retail	73.0
Local processors	1.1
Local wholesale	18.1
Export (mainland and foreign)	7.9
Total	100.1
N = 102 firms	

Table 6.--Purchases by product type and by source in 1979.

Fresh			
Local			
Fishers[1]	$18,022,008		
Wholesalers	4,325,010		
Not specified	1,931		
Total		$22,348,949	
Imports			
Mainland	$1,546,021		
Foreign	196,911		
Not specified	660,000		
Total		$2,402,932	
Total fresh			$24,751,881
Frozen			
Local			
Fishers[1]	$ 23,080		
Wholesalers	465,284		
Total		$488,364	
Imports			
Mainland	$13,133,950		
Foreign	8,019,095		
Total		$21,153,045	
Total frozen			$21,641,409
Canned and bottled			$2,992,142
Salted, dried, and smoked			$2,078,465
Fish cake			$1,152,005
Total purchases[2]			$52,615,902

[1] Includes auction fish.

[2] Totals are based on 99 firms for this and remaining "purchases" tables, unless otherwise noted.

Table 7.--Source of purchases by product type in 1979.

Local sources			
Local fishers[1]			
Fresh	$18,022,008		
Frozen	23,080		
Canned and bottled	0		
Salted, dried, and smoked	212,232		
Fish cake	158,000		
Total		$18,415,320	
Local wholesalers/brokers			
Fresh	$4,325,010		
Frozen	465,284		
Canned and bottled	62,405		
Salted, dried, and smoked	251,876		
Fish cake	3,000		
Total		$5,107,575	
Local not specified (fresh)		$1,931	
Total local purchases			$23,524,826
Imports			
Mainland			
Fresh	$ 1,546,021		
Frozen	13,133,950		
Canned and bottled	505,240		
Salted, dried, and smoked	442,979		
Fish cake	133,575		
Total		$15,761,765	
Foreign			
Fresh	$ 196,911		
Frozen	8,019,095		
Canned and bottled	2,413,048		
Salted, dried, and smoked	962,228		
Fish cake	687,000		
Total		$12,278,282	
Imports not specified (fresh)		$660,000	
Total imported purchases			$28,700,047
Others not specified			$391,029
Total			$52,615,902

[1] Includes auction fish.

Table 8.--Destination of products in 1979.

Local retail		
Fresh	$15,888,322	
Frozen	29,399,144	
Canned and bottled	4,504,577	
Salted, dried, and smoked	2,082,717	
Fish cake	2,239,619	
Total		$54,114,379
Local processor		
Fresh	$725,174	
Frozen	72,291	
Canned and bottled	0	
Salted, dried, and smoked	0	
Fish cake	0	
Total		$797,465
Local wholesale		
Fresh	$9,786,999	
Frozen	2,966,597	
Canned and bottled	73,722	
Salted, dried, and smoked	527,376	
Fish cake	76,400	
Total		$13,431,094
Export		
Fresh	$5,288,697	
Frozen	61,861	
Canned and bottled	239,400	
Salted, dried, and smoked	0	
Fish cake	234,375	
Total		$5,824,333
Total sales[1]		$74,167,271

[1]Totals are based on 102 firms for this and remaining sales tables, unless otherwise noted.

Table 9.--Purchases of major species groups in 1979.

Species group	Number of firms	Mean	Total
Tunas	44	$372,022	$16,368,950
Bottom fishes	39	168,703	6,579,414
Mahimahi (dolphinfish)	40	151,479	6,059,168
Crustaceans	30	238,417	7,152,500
Mollusks	23	157,966	3,633,210
Billfishes	16	119,868	1,917,884
Reef fishes	22	42,633	937,922
Ono (wahoo)	23	44,030	1,012,699
Akule (bigeye scad)	17	33,186	564,154
Opelu (mackerel scad)	12	37,843	454,115
Sharks	4	14,775	59,100
Others	36	187,748	6,758,925
Total	105	$490,458	$51,498,040

Table 10.--Revenue from major species groups in 1979.

Species group	Number of firms	Mean	Total
Tunas	44	$457,253	$20,119,139
Bottom fishes	40	345,417	13,816,673
Mahimahi (dolphinfish)	42	252,364	10,599,282
Crustaceans	32	265,332	8,490,626
Mollusks	25	229,097	5,727,416
Billfishes	16	150,754	2,412,063
Reef fishes	23	60,784	1,398,026
Ono (wahoo)	23	58,039	1,334,892
Akule (bigeye scad)	18	52,817	950,704
Opelu (mackerel scad)	12	75,195	902,337
Sharks	4	15,075	60,300
Others	39	220,401	8,595,644
Total	105	$708,639	$74,407,102

Table 11.--County wholesale seafood markets in 1979.

Category	Hawaii	Kauai	Maui	Subtotal	Oahu	State[1]
Number of firms	15	6	9	30	75	105
Percent				29%	79%	
Total sales[2]						
Million dollars	11.76	0.54	10.25	22.55	52.34	74.89
Percent				30%	70%	
Million pounds	5.50	0.30	2.80	8.60	20.56	29.16
Percent				29%	71%	
Sales of fresh seafood						
Million dollars	10.61	0.45	4.09	15.15	16.90	32.05
Percent				47%	53%	
Million pounds	4.87	0.22	1.52	6.61	7.15	13.76
Percent				48%	52%	
Sales of frozen seafood						
Million dollars	--	--	--	6.74	26.07	32.81
Percent				21%	79%	
Million pounds	--	--	--	1.76	9.98	11.74
Percent				15%	85%	
Defacto population[3]	91,000	43,600	80,900	215,800	797,100	1,012,900
Percent				21%	79%	

[1]Data include sales between wholesale dealers.

[2]Total sales include not only fresh and frozen seafood products but also processed forms of seafood.

[3]Defacto population includes residents on-island (not traveling) and visitors (tourists).

CONCLUSION

This composite profile of total seafood purchases at the wholesale level is generally consistent with other indications of total seafood volume in Hawaii. Hudgins (1980) estimated local consumption to be 19.0 million pounds for 1977, worth approximately $34.8 million in 1979 prices. By comparison, the 1980 enumeration survey found wholesale purchases for local consumption were 21.1 million pounds in 1979, worth $38.3 million. The enumeration survey total of $38.3 million does not include seafood which bypasses the wholesale sector. Therefore, taking into consideration the differences in coverage and methodology, the results from the 1980 enumeration survey suggest that Hawaii's seafood demand is even greater than that estimated by Hudgins who pointed out that on a per capita basis Hawaii consumers led the nation by a factor of two.

Table 12.--Hawaii seafood consumption obtained through local wholesale dealers in 1979.[1]

Foreign imports	$12.3 million
Mainland imports	15.8
Local purchases	23.5
Less intrawholesale and export[2]	-13.3
Local consumption	38.3
Local consumption[3]	21.1 million pounds

[1]As reported by wholesale dealers on the 1980 enumeration survey.

[2]Although wholesale dealers reported $5.1 million purchases from other wholesale dealers, $13.4 million were reported as sales to other wholesale dealers. Because some sales may have been outside the survey, we have chosen the mean value of the two measures to correct for double counting. Export share of purchases was estimated at $4.15 million.

[3]Calculated by subtracting from reported purchases an amount equivalent to the proportion of wholesale revenue exported or sold to other wholesale dealers.

The 1980 enumeration survey provides an updated picture of Hawaii's demand for seafood. While most locally harvested fish goes into the fresh fish market, an equivalent share of the overall seafood market comes from imported frozen seafood. The latter includes not only crustaceans and mollusks, which are generally not available in large supply from the local commercial fishery, but also a wide range of frozen fillets and specialty seafoods. Thus, seafood marketing in Hawaii involves dealing with a heterogeneous variety of products. Although there is a strong demand for locally produced fresh fish, local fishers face substantial competition from frozen imports throughout the seafood market. One way in which the local wholesale dealers are dealing with this competition is through exports of fresh and fresh-frozen fish which now amount to almost 10% of total wholesale trade.

Once the 1982 survey of retail fish sales is completed, we will be able to provide detailed estimates of seafood consumption in Hawaii and provide the first overall quantification of total volume through all levels of Hawaii's marketing network. Such estimates should be helpful to those involved in marketing seafood in Hawaii as well as those involved in fisheries development and fisheries management.

LITERATURE CITED

Hudgins, L. L.
1980. Per capita annual utilization and consumption of fish and shellfish in Hawaii, 1970-77. Mar. Fish. Rev. 42(2):16-20.